THE WEATHER ELEMENTS

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PRESSURE AND WINDS

The distribution of pressure during the month favored weather phases not common to the first month of winter. These were brought about mainly by the frequent presence of anticyclonic areas over the southern and southeastern districts, and by cyclones of more or less intensity over the central and northern districts, during the first half of the month, and by anticyclones of unusual strength over the Northwest and West during the latter half.

The month as a whole showed pressure averages above the normal in all parts of the country, with unusual excesses over the Northwest, the latter being brought about largely by the extensive anticyclones moving from Alaska and the Canadian Northwest into that region from about the 15th onward.

The frequent extension westward of the North Atlantic high pressure area into the Southeastern States and the general trend of the moderate cyclones over the central and northern districts favored moderate winter weather in nearly all districts until near the middle of the month.

About the 12th pressure began to rise in central and eastern Alaska and by the 15th had reached the unusual sea-level value of 31 inches at Eagle, probably, with a single exception, the highest pressure ever observed at that place. Attending this anticyclone the first extensive cold wave of the season overspread Alaska and advanced southward over the Canadian Northwest, reaching the northern limits of the United States on the morning of the 15th, from which date until near the end of the month abnormally high pressure attended by unusual cold persisted almost constantly in the western districts.

During the period mentioned above the sea-level pressures were frequently above 31 inches, a number of stations reporting the highest pressures ever observed, and severe cold prevailed over nearly all parts of the country, but particularly in the Northwest and West where, in many instances, it was the longest and most severe period of cold ever experienced.

The cyclones during the month were somewhat fewer than usually experienced in the first month of winter, except over portions of the interior where they prevailed frequently during the first half though they were mainly of a mild type. During the latter part of the month the cyclones moved, as a rule, over paths unusually far to the southward being forced into these by the high pressure over central and northern districts.

Compared with the pressure distribution during the preceding month the averages for December exceeded those for November over all parts of the country. While this is usually to be expected over all districts save the extreme Northeast and Northwest, still the differences are usually far less than those shown between these two months in 1924.

In the absence of important cyclones the winds were not frequently high although a few stations reported average velocities equal to or in excess of any previous records for December, and Seattle, Wash., reported the highest velocity ever known at that place on the 11th. The prevailing wind directions are shown on Chart VI.

TEMPERATURE

The important feature of the weather for the month was the sudden change from the mild winter temperatures that prevailed in most portions of the country during the first half of the month, to the severe cold that set in over the Northwest on the 15th, and after a few days overspread nearly the entire country.

Slightly preceding the advent of the cold wave some unusually high temperatures prevailed at points in the northern Rocky Mountain region, notably at Helena, Mont., where a temperature of 63° was recorded on the 14th and on the next day it had fallen to 16° below zero, a change of 79° in 24 hours. This was probably among the greatest 24-hour variations of temperature of record. Similar changes were reported at other nearby stations.

As the cold wave lingered a few days over the western districts, some unusually high temperatures were observed over the Gulf and South Atlantic States where, from the 16th to 19th, many points had the highest December temperatures ever reported.

By the end of the second decade the cold wave had advanced into the central and southern districts, reaching the extreme southern part of Texas by the morning of the 20th with temperatures several degrees below freezing and continuing below that point for nearly two days. The average daily temperatures along the southern Texas coast on the 20th and 21st were locally the lowest ever observed. This cold wave diminished somewhat in severity as it moved eastward and did not materially threaten the important fruit and trucking districts of the Southeast.

With the exception of short intervals the barometric pressure continued high over the middle and western districts throughout nearly the entire third decade of the month and unusually severe cold was experienced in that region. In fact over the far Northwest the period from the 16th to 27th was almost continuously colder than normal, usually to a marked extent, and the period as a whole was the coldest ever experienced in that region. At Portland, Oreg., the temperature was continuously below freezing from the early morning of the 16th to the late evening of the 27th, the longest period of time with such temperatures ever experienced at that point, although lower temperatures had been experienced for short periods. Similar conditions prevailed over much of the country from the Mississippi River westward, and numerous points at various times during that period had the lowest December temperatures ever recorded.

Warmer weather set in over the Northwest during the last few days of the month, and at the close moderate winter temperature prevailed in most districts.

The periods of highest temperatures were mainly during the first half, save over the southern portions of the central valleys where the highest temperatures were not recorded until about the 16th to 18th.

The lowest temperatures were mainly after the end of the second decade, although a few States in the Southeast had the minimum temperatures for the month on the 2d, and the extreme cold for the month in the northern Rocky Mountain regions and portions of the Pacific States was experienced on the 18th and 19th, at which time minimum readings 40° to nearly 60° below zero were recorded, the lowest observed −59° being reported from a point in the mountains of Wyoming. At places in California and to the northward the minimum temperatures about this time were the absolute lowest for any month. In the districts from the Mississippi Valley eastward the lowest temperatures were mainly during the last decade.

The mean temperature for the month was below normal over all parts of the country save over the Florida Peninsula and from southern Louisiana northeastward to the Chesapeake Bay region. Over the interior valleys, the

Northwest, and far West, the averages ranged from 6° to 10° or more below normal, and at many points it was the coldest December experienced in more than 50 years. Despite the severe cold over most districts, the Southeastern States had more moderate temperatures, and in southern Florida it was among the warmest Decembers of record.

PRECIPITATION

Unlike the several months preceding, December, 1924, had more than the normal precipitation over the greater part of the country, the excesses being large in the eastern Gulf and South Atlantic States and portions of the Ohio Valley. Elsewhere the variations above or below the normal were mainly unimportant, although in portions of New England the monthly falls were among the least of record and the year closed with large deficiencies. The distribution through the month was mainly satisfactory to farming and other operations, and the severe drought that had prevailed in portions of Alabama, Mississippi, Kentucky, and locally in adjacent States was broken. More rain was needed, however, in central and western Texas.

Some unusually damaging ice storms occurred, notably on the 4th and 5th, when a heavy accumulation of ice formed over an extensive region from western Kansas northeastward over portions of Nebraska and into central Iowa. Extensive damage resulted to overhead wire systems, orchards, etc., particularly in central Iowa, where it was reported as one of the worst of its character ever experienced in the State.

From the 17th to 19th, just preceding the severe cold wave, an ice storm of great extent and unusual severity extended from central Oklahoma and eastern Kansas northeastward over portions of Missouri, Illinois, and northern Indiana to southern Michigan. In portions of this area, particularly in central and southern Missouri, and central Illinois, ice formed on all exposed objects from 2 to 4 inches in thickness, and the damage resulting from this unusual coating on trees of all kinds and overhead wire systems was enormous. Trees were stripped of their branches and frequently entirely broken down, while poles bearing overhead wires were broken by the thousands, and great damage and interruption to transportation and communication interests resulted. Details concerning this storm appear elsewhere in this issue.

An unusual ice storm occurred over southeastern Texas from the 18th to 20th, particularly near the coast, likewise just in advance of the severe cold moving southeasterly, and in addition to damage to trees and wires much loss resulted to unprotected cattle from exposure to the ice storm and the severe cold immediately following.

SNOWFALL

Except from Louisiana and southern Arkansas eastward to the coast, and in portions of the Carolinas, Virginia, southern Arizona and the coast districts of California, snow fell at some period during the month in all parts of the country. In Texas snow occurred to the extreme southern part of the State, amounts of 1 inch or more being reported from the lower Rio Grande Valley. Also in California snow fell nearly to the southern limits of the State.

The monthly falls were generally above normal in the Rocky Mountain system from northern New Mexico to the Canadian boundary, and likewise over Utah and adjacent portions of the Plateau region.

In the mountains of California there was mainly less snowfall than normal, particularly in the northern portions, and but little remained on the ground at the end of the month, though it was well packed and had a good water content.

East of the Rocky Mountains there was some heavy snow at the end of the month in Kansas and portions of adjacent States, but elsewhere the fall was usually moderate to light, being particularly light in the eastern mountains and over New York and New England, where there was not sufficient for the usual lumbering operations.

Ice of good quality was available for harvest in all western districts where it is usually stored and was acquiring considerable thickness in eastern districts as the month closed.

RELATIVE HUMIDITY

Over a wide area from the lower Mississippi Valley northeastward to and including New England the relative humidity was, as a rule, materially less than normal, despite the fact that the precipitation over portions of the region was well above normal and much cloudiness existed. Over the remainder of the country there were no large areas having important departures either above or below normal though in the Rocky Mountain and Plateau regions the averages for the month were mainly higher than normal, while material deficiencies were reported from the far Northwest.